

A new species of the genus *Philothermus* Aubé (Coleoptera: Cerylonidae) from Great Smoky Mountains National Park, U.S.A.

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Abstract

A new species of cerylonid with reduced eyes from the Great Smoky Mountains, *Philothermus stephani* sp. n., is described and illustrated. A revised key to the North American species of *Philothermus* is presented.

Key words: Coleoptera, Cucujoidea, Cerylonidae, *Philothermus*, Nearctic, Great Smoky Mountains, All Taxa Biodiversity Inventory, new species, taxonomy, identification key

Introduction

Recent intensive collecting in Great Smoky Mountains National Park (GSMNP), Tennessee/North Carolina, as part of the Coleoptera inventory component of the All Taxa Biodiversity Inventory (ATBI), has resulted in the discovery of many new beetle species in several families (Konstantinov & Tishechkin 2004; Sokolov et al. 2004), many of which remain undescribed. Although the existence of the new species described herein was known prior to the ATBI, the number of available specimens has increased as a direct result of the project, prompting the current publication.

The genus *Philothermus* Aubé is the largest in the Cerylonidae with over 150 species, most of them undescribed. They are worldwide in distribution, the greatest concentration of species being in Central and South America. The genus was last reviewed for North America by Lawrence & Stephan (1975) who recognized three species. However, their concept of the genus was narrower than our present concept. *Philothermus floridensis* (Sen Gupta & Crowson) remained in the genus *Cerylcautomus* Sen Gupta & Crowson, until that genus was synonymized with *Philothermus* by Ślipiński (1990:98). The present work brings the total number of described North American species to five. Among North American genera of Cerylonidae, *Philothermus* may be recognized by the following combination of characters: 1) frontoclypeal suture absent; 2) terminal segment of maxillary palpi aciculate, much smaller than penultimate segment; 3) apical margin of last abdominal ventrite strongly crenulate; 4) antennal grooves, if present, not on hypomera; 5) procoxal cavities open or narrowly closed behind; 6) lateral pronotal margins visible from above for entire length. A more complete description of the genus can be found in Ślipiński (1990:98).

Depositories

CNC Canadian National Collection, Ottawa (Y. Bousquet)
FMNH Field Museum of Natural History, Chicago (J. Boone)

GSMNP	Great Smoky Mountains National Park Collection, Gatlinburg (A. Mayor)
LSAM	Louisiana State Arthropod Museum, Baton Rouge (V. Bayless)
UNHC	University of New Hampshire Insect Collection, Durham (D. Chandler)

***Philothermus stephani* Gimmel and Ślipiński, sp. n.**

Holotype. Male. **UNITED STATES: Tennessee:** Cocke Co.: GSMNP: Albright Grove Loop Trail, 83°16.75'W, 35°44.1'N, elev. 970m, 1 August 2004, A. Tishechkin, sifting rotten log; bearing label /LSAM 0106779/; deposited in FMNH.

Paratypes (25). **UNITED STATES: North Carolina:** Cherokee Co.: Andrews, Joanna Bald, 26 July 1967, S. Peck, A. Fiske, log litter Berlese (3, FMNH); Haywood Co: GSMNP: Richland Balsam Mtn., 1860-1950m, 27 May 1986, A. Smetana (1, CNC); GSMNP: Cataloochee Divide Tr., UTM 313142 E, 3942802 N, Sec. 17, 23 July 2002, C. Carlton, moist upland Berlese (1, LSAM); Madison Co.: Rich Mt., elev. 3000 ft, 25 July 1967, S. Peck, A. Fiske, stump litter Berlese (1, FMNH); Swain Co.: GSMNP: NE slope Mt. Collins, 5900 ft, 17-22 May 1972, A. Newton, under con. bark (1, FMNH); GSMNP: 2 mi S. Heintooga Overlook, 1 June 1990, C. Carlton, beech-fir Berlese (6, LSAM; 4, GSMNP; 2, FMNH); GSMNP: Flat Creek Tr., 83°10'21" W, 35°33'1" N, elev. 1500m, 31 July 2001, A. Tishechkin, leaf litter Berlese (1, LSAM); **Tennessee:** Cocke Co.: GSMNP: 6 mi SE Cosby, 31 May 1983, D.S. Chandler, sift forest litter (2, UNHC); GSMNP: Albright Grove Trail, 83°16'45" W, 35°44'10" N, elev. 1000m, 19 October 2001, C. Carlton, A. Cline, A. Tishechkin, decid. Berlese (1, LSAM); Sevier Co.: GSMNP: Appalachian Tr. at Beech Gap on Clingmans Dome Rd, 83°26'50" W, 35°36'36" N, elev. 1750 m., 28 June 2001, C. Carlton, A. Tishechkin, V. Moseley, forest litter Berlese (1, GSMNP); GSMNP: Trillium Gap Tr., 83°25.7' W, 35°40.3' N, elev. 1355m, 29 July 2004, A. Tishechkin, forest litter sifting (1, LSAM).

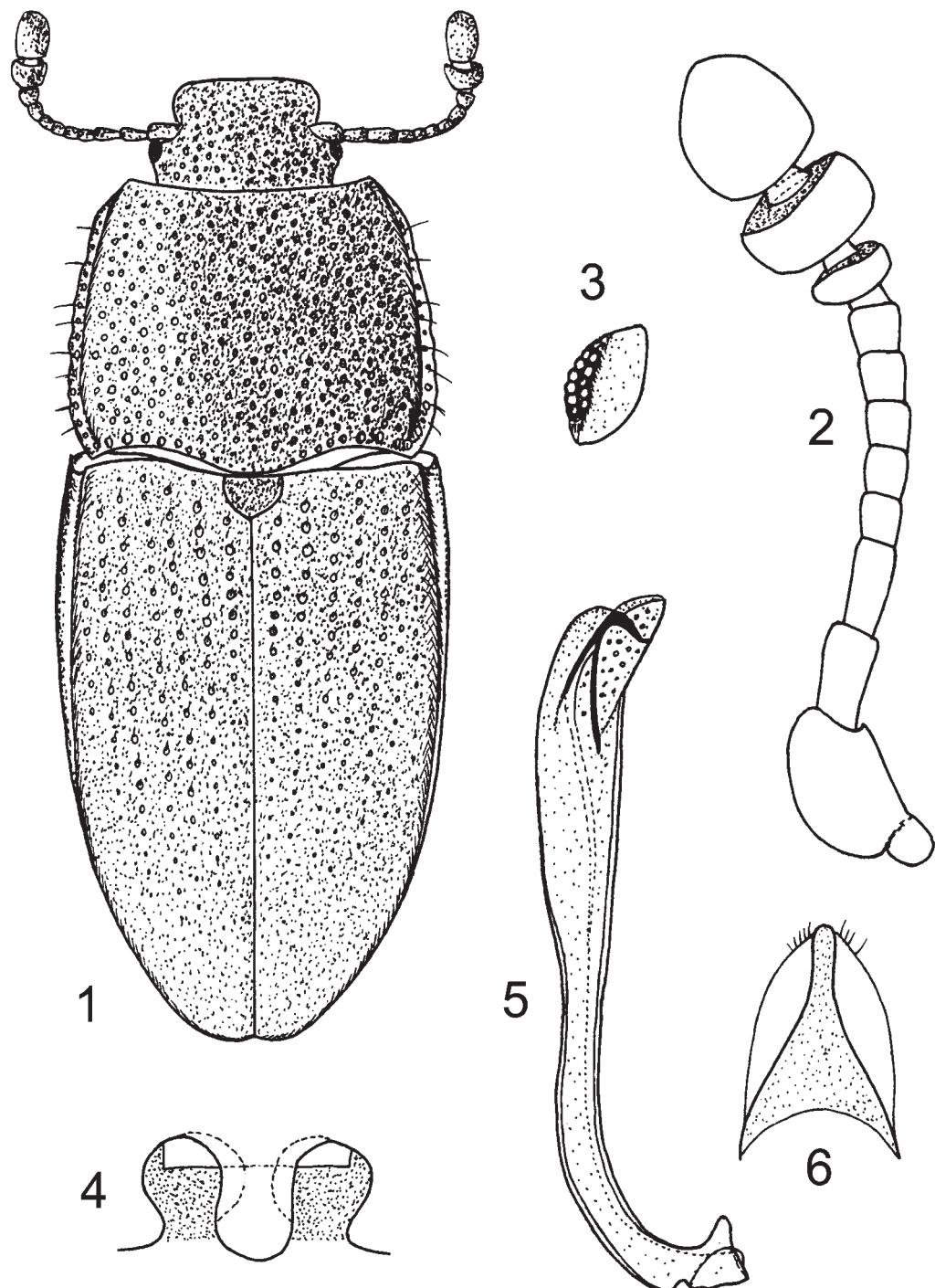
Description. Length 2.4-3.0 mm; body elongate-oval, somewhat flattened dorsoventrally (habitus, Fig. 1); color dark reddish-brown, diffusely paler on apices of elytra. Head with punctation sparse, moderately coarse; antennae 11-segmented with a loose 2-segmented club (Fig. 2); eyes depigmented, reduced to about 12 facets (Fig. 3). Pronotum relatively elongate, about 1.20 times wider than long; punctation coarse, sparse, becoming denser anterolaterally; vestiture coarse, erect, about as long as distance between punctures; microsculpture strong, isodiametric, distributed evenly across pronotum; lateral margin coarsely beaded, feebly explanate; posterior margin shallowly lobed medially. Prosternum densely, very coarsely punctured laterally, lacking antennal cavities; prosternal process nearly parallel-sided, procoxal cavities open behind (Fig. 4). Hypomera impunctate. Mesosternum coarsely, densely punctate; mesosternal process triangular, narrowly separating mesocoxae. Metasternum coarsely punctured laterally. Scutellum pentagonal, impunctate, with scattered setae. Tarsi 4-4-4. Elytron relatively elongate, about 2.87 times longer than wide and about 1.82 times longer than pronotum, with eight rows of punctures (excluding lateral row), punctures without setae; intervals each with a row of erect setae. Hindwings reduced to short pads. Abdominal ventrite 1 behind coxa about twice length of ventrites 2 and 3 combined; ventrite 1 densely, coarsely punctured laterally, each containing a coarse, suberect seta, punctures not in rows; setiferous punctures on abdominal ventrites 2-4 arranged into three irregular lateral rows. Aedeagus lying on its side in abdominal cavity; median lobe as in Fig. 5; tegmen with ring incomplete (Fig. 6).

Diagnosis. *Philothermus stephani* is readily distinguished from other species of *Philothermus* in North America by its reduced, depigmented eyes, elongate body form (especially pronotum), and large size.

Habitat. Label data indicate the species is primarily a forest litter and decayed wood inhabitant. One specimen was collected under conifer bark.

Distribution. Known only from the vicinity of Great Smoky Mountains National Park, North Carolina/Tennessee, U.S.A.

Etymology. This species is named in honor of the late Karl Stephan for his contributions to our understanding of cerylonid systematics.



FIGURES 1–6. *Philothermus stephani* Gimmel and Ślipiński, sp. n.; 1) habitus, dorsal view; 2) antenna; 3) right eye, anterior view; 4) prosternal process and procoxal cavities; 5) median lobe of aedeagus, ventral view; 6) tegmen of aedeagus, internal view.

Key to Nearctic species of *Philothermus*

- 1 Prosternum laterally with cavities for reception of antennae; labrum acute at apex; antenna 10-segmented with 1-segmented club; length < 1.3 mm; northern Florida.....

- *P. floridensis* (Sen Gupta and Crowson)
- Prosternum without antennal cavities; labrum not acute at apex; antenna 11-segmented with 2-segmented club; length > 1.3 mm 2
- 2(1) Elytron with 7 rows of punctures (not including marginal row); lateral margin of pronotum narrow; procoxal cavities narrowly closed behind; California *P. occidentalis* Lawrence and Stephan
- Elytron with 8 rows of punctures (not including marginal row); lateral margin of pronotum broad and explanate; procoxal cavities open behind; eastern North America 3
- 3(2) Eyes greatly reduced and depigmented, only about 3 facets wide at maximum width (measured along longitudinal axis of body) (Fig. 3); hindwings greatly reduced; length 2.4-3.0 mm; Great Smoky Mountains, Tennessee and North Carolina *P. stephani* Gimmel and Ślipiński, sp. n.
- Eyes not reduced, darkly pigmented, 6 or more facets wide at maximum width (measured along longitudinal axis of body); length less than 2.4 mm 4
- 4(3) Elytral vestiture consisting of numerous erect hairs that are usually much longer than the diameter of an elytral puncture; pronotal punctuation coarser and denser, punctures usually separated by less than their own diameter; lateral margin of pronotum distinctly crenulate; lateral margin of elytron visible from above almost to apex; Georgia and Florida *P. puberulus* Schwarz
- Elytral vestiture consisting of very short hairs that are shorter than a puncture diameter, and a few scattered longer hairs; pronotal punctuation finer and sparser, punctures usually separated by more than their own diameter; lateral margins of pronotum relatively smooth; lateral margin of elytron visible from above only for anterior half; widespread in eastern North America *P. glabriculus* LeConte

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References

- Konstantinov, A. & Tishechkin, A. (2004) The first Nearctic leaf litter flea beetle (Coleoptera: Chrysomelidae) from the Great Smoky Mountains National Park. *Coleopterists Bulletin*, 58(1), 71-76.
- Lawrence, J.F. & Stephan, K. (1975) The North American Cerylonidae (Coleoptera: Clavicornia). *Psyche*, 82(2), 131-166.
- Ślipiński, S.A. (1990) A monograph of the world Cerylonidae (Coleoptera; Cucujoidea) Part I – Introduction and higher classification. *Annali del Museo Civico di Storia Naturale "Giacomo Doria"*, 88, 1-273.
- Sokolov, I.M., Carlton, C.E. & Cornell, J.F. (2004) Review of *Anillinus*, with descriptions of 17 new species and a key to soil and litter species (Coleoptera: Carabidae: Trechinae: Bembidiini). *Coleopterists Bulletin*, 58(2), 185-233.